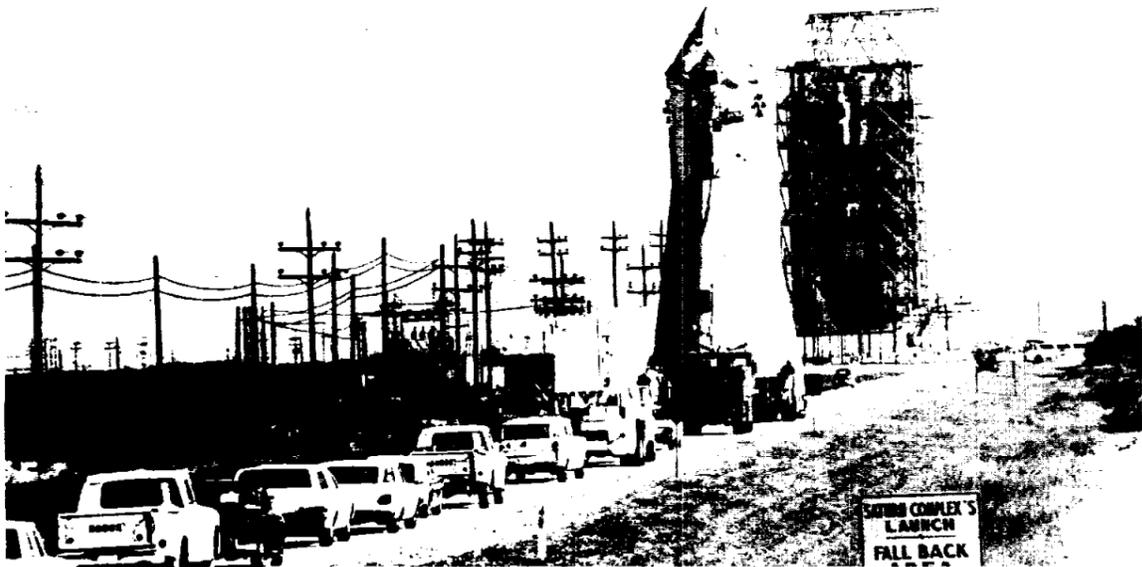




Slowest Part of Its Mission



APOLLO CONVOY—Apollo spacecraft 012 command and service module rolls slowly down the road to KSC Launch Complex 34 followed by a retinue of vehicles. Since this photo was taken, the spacecraft has been hoisted to the top of the service structure and mated mechanically and electrically to the Uprated Saturn I launch vehicle. Scheduled for the first manned Apollo mission, Apollo 204, the spacecraft crew will be Virgil I. Grissom, Ed White and Roger Chaffee.

680-PAGE HISTORY—

Mercury Story Told In This New Ocean

NASA Monday published a 680-page illustrated history of Project Mercury, the first United States manned space flight program.

The book is titled *This New Ocean*, a phrase from a speech by President Kennedy in 1962 in which he said, "We intend . . . to become the world's leading spacefaring nation." The book is for sale as NASA SP-4201 for \$5.50 (in cloth binding) from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

The authors are three professional historians, Loyd S. Swen-

son, Jr., assistant professor of history at the University of Houston; James M. Grimwood, MSC historian; and Charles C. Alexander, associate professor of history at the University of Georgia. The work is the first of a series of NASA program histories being planned under the functional management of Eugene M. Emme, official NASA historian.

A foreword by Melvin Kranzberg, chairman of the NASA Historical Advisory Committee, who teaches at Case Institute of Technology and is executive secretary of the Society for the History of Technology, says the authors had unrestricted access to source materials and that they were allowed to pursue their task "with the fullest freedom."

Project Mercury spanned 55 months from authorization through Cooper's 22-orbit flight in May 1963 and, the authors of *This New Ocean* estimate, involved at one time or another more than 2 million people in NASA, the military services, educational institutions and the plants and laboratories of about 7,300 contractors and suppliers.

The book closes with this evaluation of the project: "Mercury saw the evolution of the astronaut from little more than a passenger in a fully automatic system to an integral and fully integrated element in the entire space flight organism. By the end of the project, the Mercury capsule, instead of simply being a machine with a man in it, had truly become a manned space vehicle."

Flight S-II Stage Barged to Cape; Due Saturday

The first flight version of Saturn V's second stage, the S-II stage, Monday was shipped from the NASA Mississippi Test Facility aboard the NASA Barge *Poseidon* en route to the Kennedy Space Center.

Successfully test fired twice for a total burn time of more than 12 minutes, the million-pound thrust stage is scheduled to arrive at KSC tomorrow, where it will be mated to the first and third stages of the first flight version of Saturn V in the Vehicle Assembly Building.

Apollo/Saturn 501 is scheduled for launch in the second quarter of 1967.

Science-Applications Directorate Formed

A new directorate has been formed at MSC to meet the Center's growing responsibility in the area of space science and applications.

In announcing the new Science and Applications Directorate, MSC Deputy Director George M. Low emphasized that the new organization will provide a point of contact for scientists throughout the country interested in taking part in the manned space flight program.

Low said that increasing emphasis has been placed on MSC's scientific base with assignment of responsibility in three major areas:

- Lunar science programs.
- Earth resources programs.
- Meteorology investigations using manned spacecraft.

Other areas of science responsibility, performed in the past by various elements of the Center, also have been merged in the new directorate's charter. These areas include:

- Space physics investigations.
- Conceiving, developing and integrating experimental packages for science and applications programs.
- Providing design data and real-time mission information on radiation, micrometeorites and lunar surface conditions for manned missions.
- Supporting scientists in integrating their experiments into the manned space program.

• Supporting astronaut training in science areas and experiment operation.

• Handling the lunar sample program.

Low said a recognized scientist is being sought to head the new directorate. Meanwhile, Robert O. Piland has been named deputy director and will head the organization pending appointment of a director.

Low pointed out that scientists outside NASA are being urged to participate in the expanded effort here as principal investigators and lunar sample program experimenters.

In the earth resources-applications areas, the directorate will assess a variety of flight systems and data acquisition approaches and will study potential benefits to be derived from manned space application programs. Much of this work will be done in cooperation with other NASA centers and government agencies.

The potential of the earth resources effort includes more effective world crop status determination, better assessment of the world's water supply, aiding pollution studies, oceanography work and more accurate geological as well as geographical mapping.

The new unit will employ 230 people, transferred primarily from the Space Science Division and Experiments Program Office, both of which have been

(Continued on page 2)

AT COMPLEX 34—

First Manned Apollo Mated To Saturn I Launch Vehicle

Apollo spacecraft 012, scheduled for the first manned Apollo

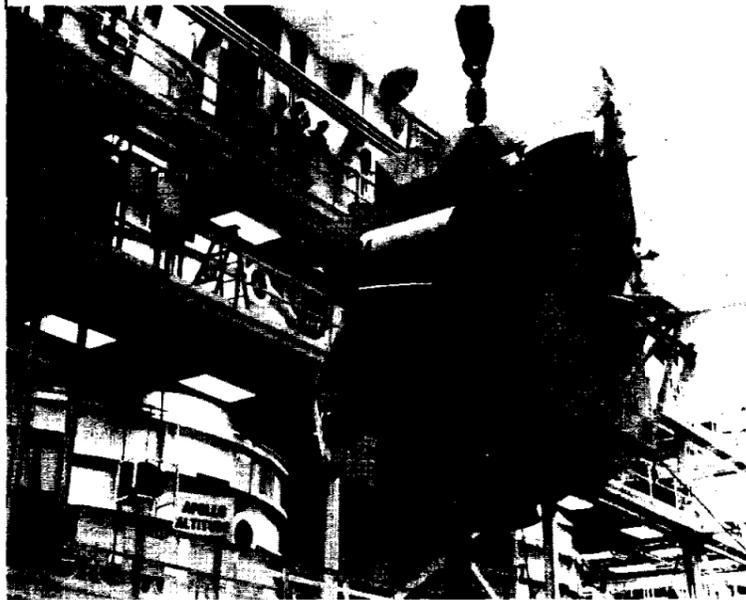
mission, this week was electrically mated to its Uprated Saturn I launch vehicle at Launch Complex 34 after successfully completing altitude chamber tests at KSC.

Combined spacecraft systems tests were completed successfully and cryogenic hydrogen and oxygen Monday were loaded aboard the spacecraft's fuel cell system. The solid-fuel Launch Escape System has also been mated to the command module attach points.

Electrical mating of the spacecraft to the launch vehicle was expected to be complete by mid-week.

In other Apollo preflight preparations at KSC, Apollo spacecraft 017, scheduled for the unmanned first Saturn V mission, has been moved from the Manned Spacecraft Operations Building to the Vehicle Assembly Building. The spacecraft is undergoing cabin leak checks and is being cabled up for combined systems tests expected to begin next week.

Portent of Things to Come



LUNAR MODULE ON STRINGS—An overhead bridge crane moves a mock-up of the Apollo Lunar Module sans landing gear through the high-bay of the KSC Manned Spacecraft Operations Building—a scene that will be duplicated many times in the next several months with flight-destined Lunar Modules.

MSC Blood Bank Sets Week-Long Blood Collection

The MSC Group Blood Deposit Program has scheduled visits by the bloodmobile to MSC and contractor sites beginning next week.

Dates and places are as follows: January 23—MSC Bldg 8; January 24—General Electric NB Bldg 1; January 25—MSC Bldg 8; January 26—Ellington AFB Bldg 276; January 27—MSC Bldg 8; January 30—Lockheed Alpha and Gemini Building, and January 31—MSC Bldg 8.

Bloodmobile hours will be 9 am to 3 pm except Ellington which are 9 am to 4 pm.

MSC employees may make appointments to deposit blood by calling Ed Stelly 3378, Howard Alison 4611, Don Bray 4766, Hal Bishop 5331 or Sandy Burdsal 5156.

Pint-Size Party-Goers Bend Santa's Ear



YOUNGER SET—Photos of the MSC children's Christmas party got squeezed out of the last issue of *Roundup*, and it is 287 shopping days until Christmas 1967. But, better late than never, here are two photos from the party. At left, a group of moppets engage in table-talk with a clownish friend. It is difficult to tell whether the lad talking to Santa Claus, above, is telling his age, wants three tricycles for Christmas or three fingers of root beer. Behind the white face foliage is Claude Ingels of Space Science Division.

MANNING MISSION CONTROL—

Familiar Red-White-Blue Teams Back in Action for Apollo 204

Christopher C. Kraft, Jr., Eugene F. Kranz and John D. Hodge will be the flight directors for the three teams of flight controllers in Mission Control Center-Houston when the first manned Apollo mission is flown later this quarter.

The three teams will man the second-floor Mission Operations Control Room (MOCR) and adjacent staff support rooms on a three-shift basis. Each team is designated by color: Kraft, Red; Kranz, White, and Hodge, Blue.

Flight controllers manning other console positions in the MOCR are listed by position and team (R-Red; W-White, B-Blue). These assignments are:

Assistant Flight Director: R-Charles S. Harlan; W-Lawrence S. Canin; B-Jones W. Roach. Operations and Procedures Officer: R-William S. Molnar, Jr.; W-Larry W. Keyser; B-John H. Temple.

Flight Surgeon: R-Dr. Charles A. Berry; W-Dr. D. Owen Coons; B-Dr. A. Duane Catterson. Spacecraft Communicator:

R-James A. Lovell; W-Charles M. Duke; B-Vance D. Brand. Booster Systems Engineers (launch phase only): Charles W. Casey, Dexter H. Burdeshaw and Robert W. Wolf.

Guidance Navigation and Control Engineer: R-Gerald D. Griffin; W-Briggs H. Willoughby; B-Arnold D. Aldrich and Talivaldis K. Sulmeisters. Electrical, Environmental and Communications Engineer: R-Richard D. Glover; W-Thomas R. Loe; B-William C. Burton and John W. Aaron.

Flight Dynamics Officer: R-Philip C. Shaffer and Jerry C. Bostick; W-Maurice G. Kennedy; B-H. David Reed. Guidance Officer: R-Willard S. Presley and Granville E. Paules; W-Walter W. Wells; B-Manfred "Dutch" von Ehrenfried.

Retrofire Officer: R-John S. Llewellyn; W-Charles F. Deiterich; B-James F. Payne. Flight Activities Officer: R-W. A. Anderson; W-Jeremy B. Jones; B-John B. Cotter. Experiment Activities Officer: R-James R. Bates; W-Henry B. Fisher; B-Merril A. Lowe.

Network Controller: R-Ernest L. Randall; W-Richard G. Ayers; B-Lawrence Lonero. Assistant Network Controller: R-John W. Hatcher; W-George M. Egan, Jr.; B-Douglas R. Wilson.

Public Affairs Officer: R-Paul Haney; W-Terry White; B-Ben James.

Manning positions in the third-floor Recovery Control Room will be: Red Team—Jerome Hammack, J. Vice, R. Blakley, and D. Mannering. White Team—E. Bullock, G. Robinson, J. Hoisington and D. Jacobs. Blue Team—John Stonesifer, J. Hoover, F. Herbert and S. Ellis.

Landing and Recovery Division employees assigned to the prime recovery vessel, the aircraft carrier USS *Essex*, are: Don Stullken, C. Filley, E. Pettrash, D. Dubay and L. Huntington. Aboard destroyers stationed in the Atlantic are W. Oldfield and L. Brown; in the Pacific, R. Green and C. Koontz.

Other Recovery assignments are: Recovery Control Center-Kunua, Hawaii—J. Abernathy, W. Wood and J. Shannon. Recovery Control Center-Cape Kennedy—R. Kirby, M. Richmond, J. Cooper and R. Bass. Sub-RCC Albrook AFB, Panama Canal Zone—M. Pettit. Sub-RCC Moron, Spain—T. Holt. Lajes, Azores, USAF Air Rescue Service—J. Chapman. Hickam AFB, Honolulu USAF/ARS—W. Glenn. Bermuda USAF/ARS—F. Sponholz and R. Simantel, and Tachikawa AFB, Japan USAF/ARS—S. Berthiaume.

New Science Directorate

(Continued from page 1)

merged into the new directorate. The directorate will embrace five offices and two divisions. Offices are Advanced Systems, Applications Analysis, Lunar Surface Project, Applications Project and Test and Operations. Divisions are Space Physics, and Lunar-Earth Sciences.

The directorate brings to six the number of directorates in MSC. The others are Engineering and Development, Flight Crew Operations, Medical Research and Operations, Flight Operations, and Administration. In addition there are three program offices: Gemini, which is being phased out; Apollo Spacecraft and Apollo Applications.



JPL, TRW Negotiate Mars-Mariner Power

The Jet Propulsion Laboratory has selected TRW, Inc., of Redondo Beach, Cal., for negotiations on a contract for the design modification, fabrication and testing of the propulsion subsystem for the unmanned Mariner mission to Mars in 1969.

JPL has project management responsibility to the National Aeronautics and Space Administration for the two-spacecraft Mariner-Mars mission.

Total value of the work on the propulsion subsystem is estimated to exceed \$1 million. The contract calls for flight hardware for both Mariners and associated ground checkout and test equipment.

Mariner's propulsion subsystem for each spacecraft will include a high pressure gas reservoir, a pneumatic pressure regulator, propellant tank and bladder and a 50-pound constant-thrust rocket engine capable of firing twice during the mission to Mars. Anhydrous hydrazine will fuel the liquid monopropellant engine.

Primary function of the subsystem is to remove or reduce divergences from the planned launch injection trajectory so that a Mars flyby with a sufficient miss distance can be reasonably assured. This trajectory correction maneuver is to be performed within one to two weeks after

launch and a second maneuver may or may not be required.

The Mariners, weighing about 800 pounds, will be launched by Atlas-Centaur rockets on flyby trajectories to investigate the Martian atmosphere, photograph the planet's surface, and gather data to be used for the design of landing capsules.

Massaged Data Upgrades X-15 Speed Record

Engineers at the Flight Research Center, Edwards, Cal., have raised the record speed made by Maj. William J. Knight, USAF, in the X-15. Maximum speed has been increased from 4,159 mph to 4,233 mph and the Mach number has been increased from 6.1 to 6.33 times the speed of sound.

The previously-released figures were obtained from raw flight data. The new figures have been refined by engineers to include the effects of pressure, altitude, winds aloft and temperature.

Maj. Knight set the unofficial record in X-15 No. 2, with its external propellant tanks, on Nov. 18. The previous X-15 speed record of 4,104 mph (Mach 5.92) was set by the late Joseph Walker June 27, 1962.

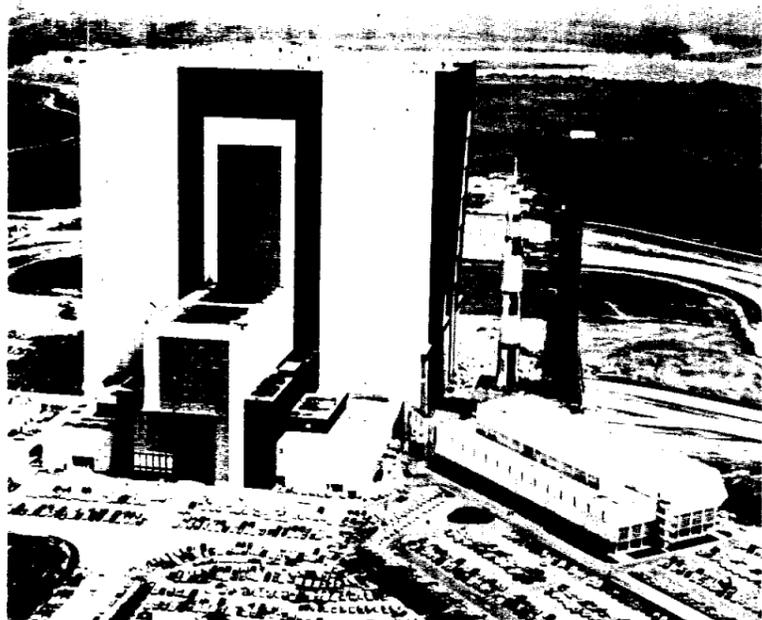
Charm Club Goes Texan

It's "Go-Texan" time again in these parts and the EAA Charm Club is getting into the act with a Western Dinner and Style Show as a salute to the Houston Livestock Show and Rodeo.

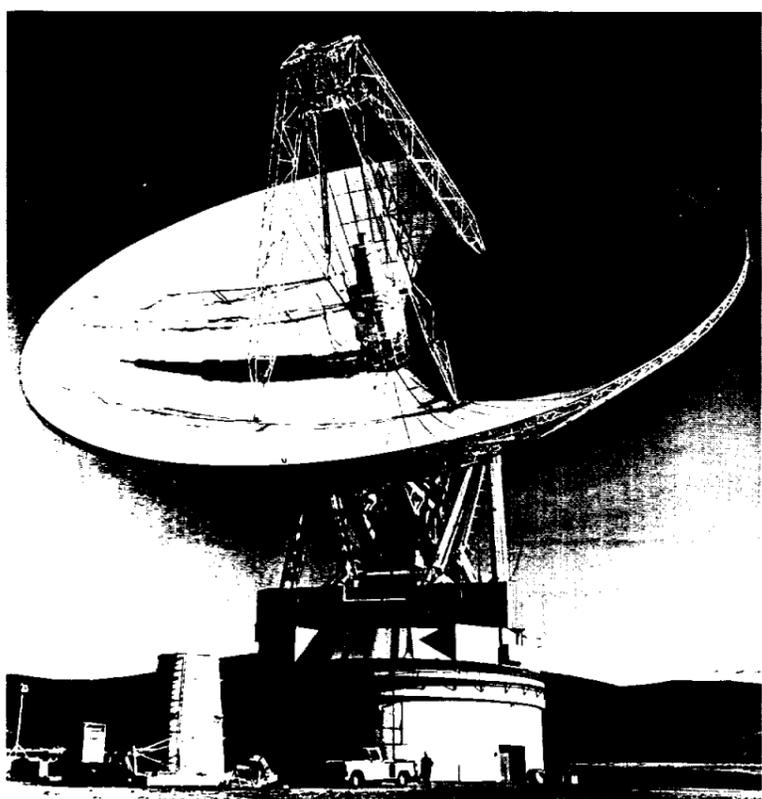
The Dinner-Style Show will be held at the Nassau Bay Hotel February 8 at 6 pm. Modeling the latest in corral-and-range togs will be members of the Charm Club.

Dinner tickets at \$2.50 a head are for sale in the MSC Cafeteria.

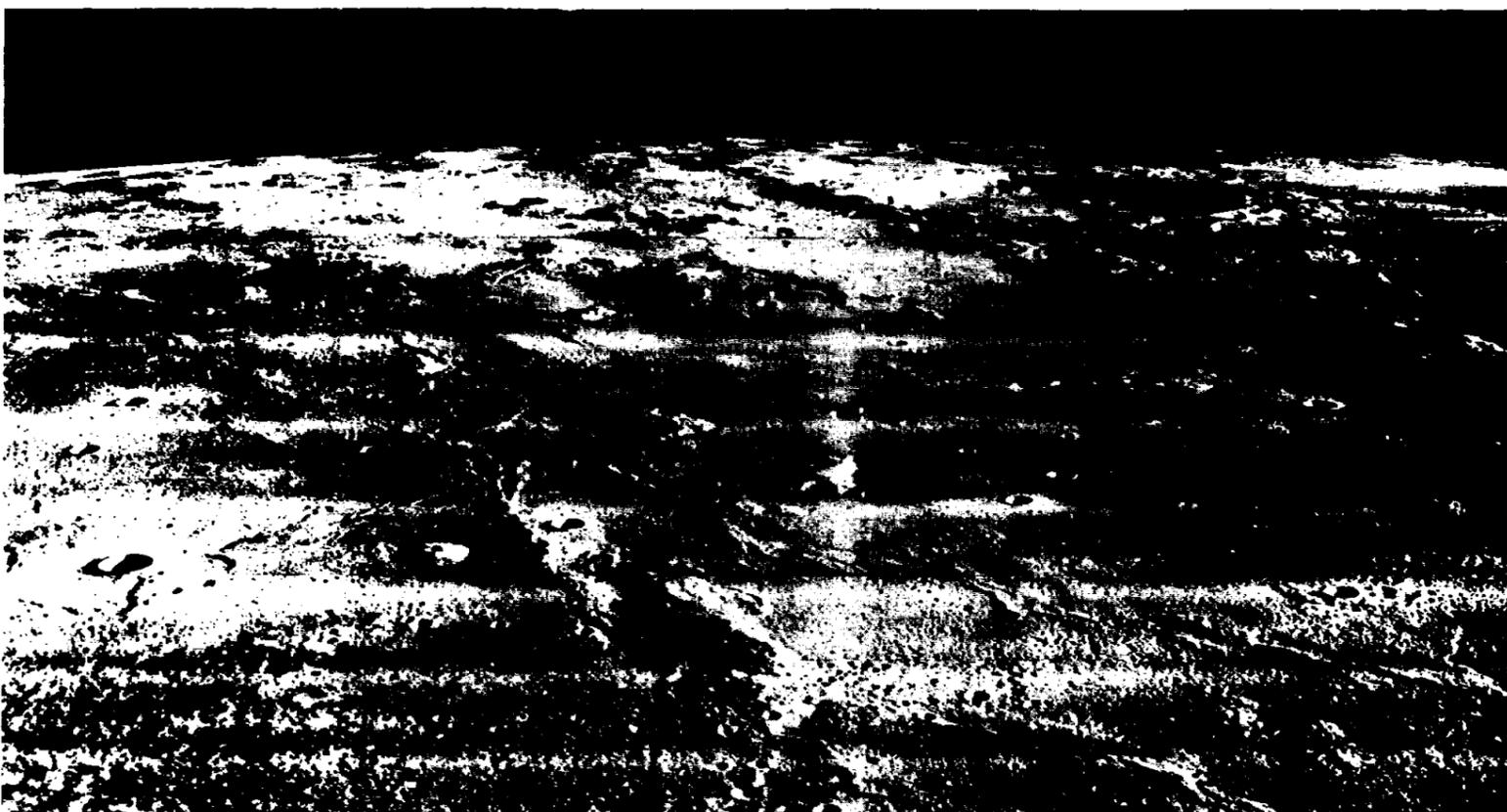
Gemini, Surveyor, Lunar Orbiters



TALL HALL—The Vehicle Assembly Building at Kennedy Space Center, largest building in the world, got its first checkout in 1966 when a test version of the Saturn V was assembled on a mobile launcher in the VAB and the whole stack moved overland to Launch Complex 39.



THE BETTER TO HEAR WITH—The Goldstone, California NASA Deep Space Tracking Network's 210-foot diameter tracking and communications antenna went into service in June, 1966. Largest dish of its kind in the world, it is capable of tracking spacecraft as far out in space as the planet Pluto—2.7 billion miles at nearest approach to Earth.



MOONSCAPE—An area the size of Massachusetts, Connecticut and Rhode Island is covered in this oblique photograph made by Lunar Orbiter II. Domes ranging from two to ten miles in diameter and from 1,000 to 1,500 feet high confirm the Moon's long history of volcanic activity. The photo was made with Lunar Orbiter's wide-angle lens.

Completion of the 12-mission Gemini project, a soft landing on the Moon and startling new photographs of the Earth and the lunar surface highlighted the United States space program during 1966.

When James A. Lovell, Jr., and Edwin E. Aldrin, Jr., splashed down in the Atlantic Ocean November 15 in their Gemini XII spacecraft, a major milestone had been passed toward achieving the national goal of landing men on the Moon by 1970.

They and the crews of the preceding six Mercury and nine Gemini manned flights had proved that men could withstand the rigors of space, maneuver their craft, rendezvous in orbit and carry out activity in the hostile environment.

Lunar Portraits

NASA's 1966 unmanned satellite program just as importantly continued its contribution to the ultimate lunar landing by gathering information necessary to the success of the manned program.

Surveyor I was vital to NASA because many of its elements of design and concept are similar to those on the Lunar Module designed to place US astronauts on the Moon.

Launched from Cape Kennedy May 30, the Surveyor dropped gently to the Moon's Ocean of Storms two and one-half days later. Its contribution was more than 11,000 photographs of the lunar surface.

Later, two Lunar Orbiter spacecraft were launched to photograph possible landing sites for the astronauts. Lunar Orbiter I transmitted the first picture of the Earth made from the area of the Moon. Lunar Orbiter II, launched November 6, made on November 23 the first close-up (28 miles) pictures of the Crater of Copernicus, one of the most prominent features on the Moon's face.

This photograph gave many persons the first lunar picture they could readily relate to Earth topography.

It clearly showed mountains rising 1,000 feet from the crater floor with slopes up to 30 degrees. This photo and others taken by the Orbiter's telephoto lens will be used in analyzing potential landing areas before astronauts attempt their first flight to the Moon.

Saturn Gets Ready

Also in preparation for the manned Apollo mission—the first is scheduled early this year—the launch vehicle development program saw three successful firings of the Uprated Saturn I, predecessor of the mighty Saturn V which will be used for the lunar landing flight.

Satellite Exploration

Other scientific, weather and communications satellites launched in 1966 included the second Nimbus meteorological craft, Nimbus II, which was placed in polar orbit, as well as three Environmental Science Services Administration (ESSA) satellites. The ESSA launches inaugurated the operational meteorological satellite system established by the U.S. Dept. of Commerce.

An Orbiting Geophysical Observatory (OGO) joined two others already in orbit to study the relationship between the Sun and the nature of the Earth's environment. The Passive Geodetic Survey Satellite (Pageos I) offered better geodetic data on the entire Earth than could have been gained by traditional means.

Explorers XXXII and XXXIII returned information about the Earth's environment with XXXIII looking at areas in space far beyond the Moon. In addition, Pioneer VII joined Pioneer VI in orbit around the Sun to continue a program of measurements at widely separated points in interplanetary space over the solar cycle.

Hardware Development

The Centaur hydrogen-powered launch vehicle was test-fired twice successfully and launched two Surveyor spacecraft. The vehicle was established as fully operational and capable of placing large payloads on the Moon and ready for interplanetary roles in the future.

NASA continued its studies in flight safety and the rocket-powered X-15 research aircraft was flown at a new speed record of 4,223 miles per hour.

An all-solid propellant rocket motor producing 3.5 million pounds of thrust was ground-tested successfully. Meantime, a 260-inch-diameter motor with 5 million pounds of thrust was scheduled for the test stand in 1967.

Flown successfully was the M-2 lifting body, a two-and-one-half-ton manned vehicle under study to help NASA establish a technological base for the design of future spacecraft.

1966 M

Date	Name	L
1/20	Apollo Launch Escape System Test	L
2/3	*ESSA I	T
2/9	Reentry V	S
2/26	Apollo/Saturn	U
2/28	*ESSA-II	T
3/16	Gemini VIII Target Vehicle	A
3/16	Gemini VIII	T
4/7	Centaur	A
4/8	OAO-I	A
5/15	Nimbus II	T
5/17	Gemini IX Target Vehicle	A
5/25	Explorer XXXII (AE-B)	T
5/30	Surveyor I	A
6/1	Gemini IX-A (ATDA)	A
6/3	Gemini IX-A	T
6/6	OGO III	A
6/23	PAGEOS I	TI
7/1	Explorer XXXIII (IMP-D)	TI
7/5	Apollo Saturn	U
7/18	Gemini X Target Vehicle	A
7/18	Gemini X	TI
8/10	Lunar Orbiter I	A
8/17	Pioneer VII	TI
8/25	Apollo/Saturn	U
9/12	Gemini XI Target Vehicle	A
9/12	Gemini XI	TI
9/20	Surveyor II	A
10/2	*ESSA III	TI
10/26	Centaur	A
10/26	*Intelsat II	TI
11/6	Lunar Orbiter II	A
11/11	Gemini XII Target Vehicle	A
11/11	Gemini XII	TI
12/6	ATS-1	A
12/14	Biosatellite I	TI

*Launched for Environmental Science Admin., U. S. Dept. of Commerce responsible for spacecraft development launch.

**Mission performance not yet fully
***Not NASA Mission (Communication Corporation).

Top 1966 Space News

International Cooperation
International cooperative space activities carried out during the year included sounding rocket experiments with Argentina, the Federal Republic of Germany, Brazil, Canada, India, Norway, Pakistan and Spain.

In particular, the US cooperated in the launching of sounding rockets during solar eclipses in May and November with Greece, Brazil and Argentina. An agreement with France was reached for a joint project to collect meteorological data with balloons and satellites.

Program Growth
During 1966, the space agency increased its tracking facilities around the world in support of manned and unmanned satellites. It also expanded its Technology Utilization Program: the dissemination of information about specific inventions, innovations and discoveries growing out of the overall space research effort. NASA's last launches of the

year were the Applications Technology Satellite (ATS-B) and the Biosatellite A, first of a series in each case for large-scale studies of communications and basic biology in space, respectively.

More than 300 meteorological sounding rockets were launched as part of NASA's program to measure weather conditions above balloon altitudes and below that of satellite orbits. Another 100 sounding rockets were launched for scientific investigation of Earth and space phenomena.

In addition to the ESSA satellites launched for the Department of Commerce, NASA also launched Intelsat 2 for the Communications Satellite Corp. The satellite, in stationary orbit over the Pacific Ocean, can handle television data transmissions or voice channels and part of its capacity will be purchased by NASA for Apollo support.

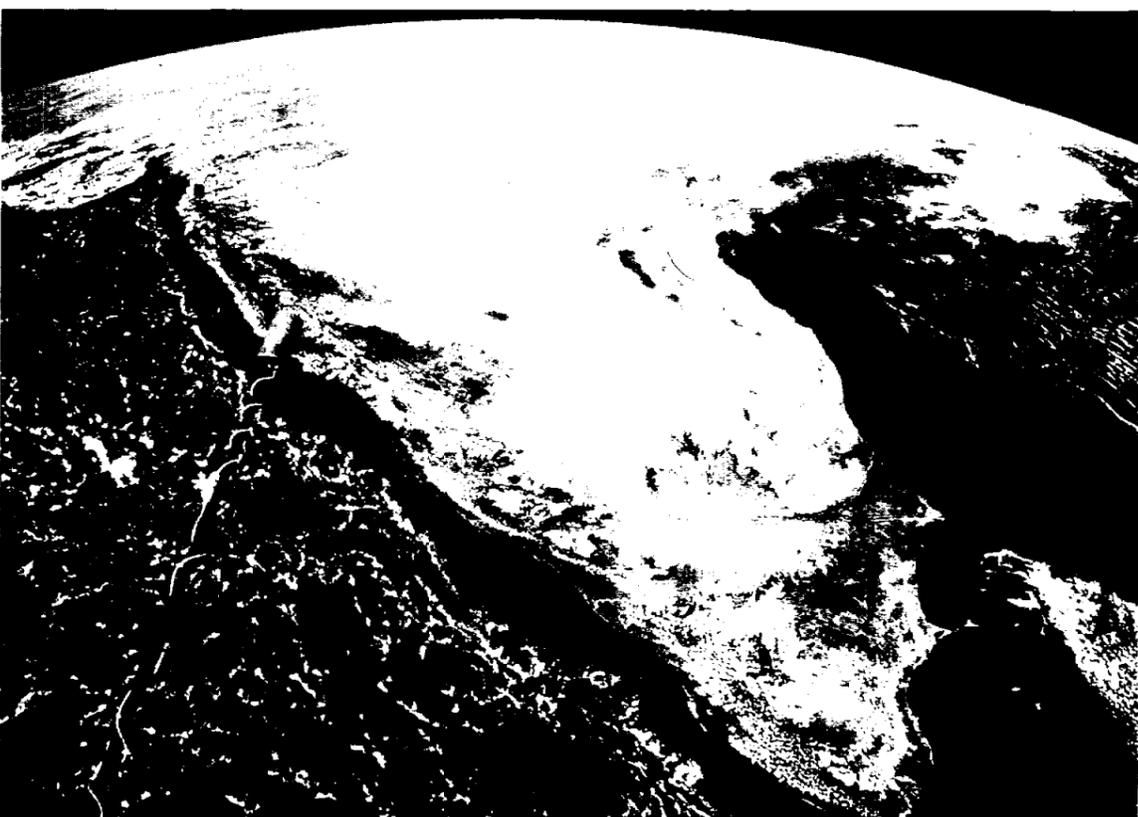


SPEED MERCHANT—The NASA/USAF research aircraft X-15 No. 2 November 18, 1966 was flown to a new speed record at the NASA Flight Research Center, California. Maj. William J. Knight flew the X-15 to a top speed of 4,233 mph (Mach 6.33) to break the 4,104 mph (Mach 5.92) record set in 1962 by the late Joseph Walker. The X-15 was equipped with external propellant tanks for the new record run.

Major NASA Launches

Launch Vehicle	Launch Site	Mission	Results	
			Vehicle	Mission
Little Joe II	WS	Intermediate-Altitude Abort Test	S	S
Thor-Delta	KSC	Operational Weather Satellite	S	S
Scout	WI	Test Phenolic Nylon for Heat Shield	S	S
Unmanned Saturn I (AS-201)	KSC	Launch vehicle, Spacecraft and Heat Shield Test	S	S
Thor-Delta	KSC	Operational Weather Satellite	S	S
Atlas-Agena	KSC	Gemini Rendezvous & Docking Target Vehicle	S	F
Titan II	KSC	2 Man Earth Orbit Rendezvous & Docking	S	F
Atlas-Centaur 8	KSC	Centaur Hydrogen Engine Restart (two burn) Test	F	F
Atlas-Agena	KSC	Orbiting Astronomical Observatory	S	F
Thor-Agena	WTR	Adv. Weather Observ. Satellite	S	S
Atlas-Agena	KSC	Gemini Rendezvous & Docking Target Vehicle	F	F
Thor-Delta	KSC	Aeronomy Studies	S	S
Atlas-Centaur	KSC	Soft Lunar Landing & Photography	S	S
Atlas	KSC	Augmented Target Docking Adopter	S	F
Titan II	KSC	Rendezvous and/or Docking and/or EVA	S	F
Atlas-Agena	KSC	Study Earth Environment	S	S
Thor-Agena	WTR	Passive Geodetic Earth orbiting satellite	S	S
Thor-Delta	KSC	Earth-Moon Environment Studies out to Lunar Distances	S	S
Unmanned Saturn I (AS-203)	KSC	Observe Liquid-Hydrogen in Orbital Flight	S	S
Atlas-Agena	KSC	Gemini Rendezvous & Docking Target Vehicle	S	S
Titan II	KSC	Manned Rendezvous, Docking & EVA	S	S
Atlas-Agena	KSC	Lunar Photography for Apollo Landing Sites	S	S
Thor-Delta	KSC	Solar Studies	S	S
Unmanned Saturn I (AS-202)	KSC	Launch Vehicle, Spacecraft, and Heat Shield Test	S	S
Atlas-Agena	KSC	Gemini Rendezvous & Docking Target Vehicle	S	S
Titan II	KSC	Manned Rendezvous, Docking & EVA	S	S
Atlas-Centaur	KSC	Soft Lunar Landing & Photography	S	F
Thor-Delta	WTR	Operational Weather Satellite	S	S
Atlas-Centaur 9	KSC	Centaur Hydrogen Engine Restart (two burn) Test	S	S
Thor-Delta	KSC	Synchronous Communication Satellite	S	***
Atlas-Agena	KSC	Photography for Apollo Lunar Landing Sites	S	S
Atlas-Agena	KSC	Gemini Rendezvous & Docking Target Vehicle	S	S
Titan II	KSC	Manned Rendezvous, Docking & EVA	S	S
Atlas-Agena	KSC	Communications and Technology	S	**
Thor-Delta	KSC	Biological experiments on living organisms in space	S	F

Launch Sites:
 WS White Sands Test Facility, N. M.
 KSC Kennedy Space Center, Fla.
 WI Wallops Island, Va.
 WTR Western Test Range, Calif.
 S Success F Failure

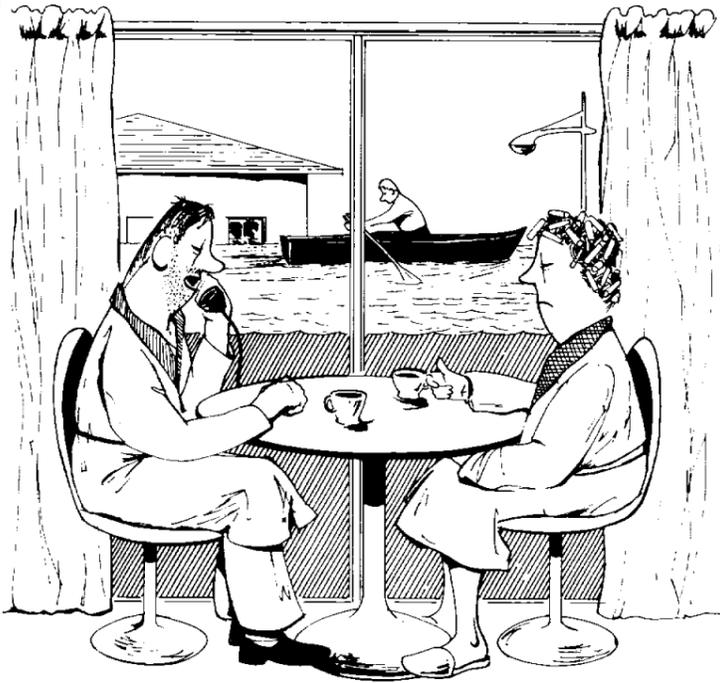


CLOUDY SUBCONTINENT—India and Ceylon were photographed from 540 miles by Gemini XI crewmen Charles Conrad and Richard F. Gordon. Top of the photo is north, with the Bay of Bengal to the right of India, and the Arabian Sea at left. Adam's Bridge, a natural causeway, can be seen partially joining Ceylon to India at lower right.



SHADOW PATTERN—Photographers try not to have their own shadow appear in their photos when the sun is at their backs, but Surveyor I was given a dispensation to this rule June 13, 1966 when it shot this photo of its own shadow the lunar sunset was less than 24 hours away. Television-transmitted still photos were received and processed at the NASA Jet Propulsion Laboratory in Pasadena, California.

On The Lighter Side



Hello. Happy Homes Development Company?

Space News Of Five Years Ago

January 23, 1962—Robert R. Gilruth, director of the Manned Spacecraft Center, was awarded the Louis W. Hill Space Transportation Award by the Institute of Aeronautical Sciences for his "outstanding leadership in technical development of spacecraft for manned space flight."

January 26, 1962—During hearings of the Joint Senate and House Economic Committee, Senator Paul Douglas stated that "the public has never really had a chance to consider" the space program and that one third of the members of the American Astronautical Society had indicated in a poll that "a man landing on the moon was not desirable." Budget Director David E. Bell stoutly defended the space program. Senator Sparkman questioned Senator Douglas: "I wonder whether Congress felt the same way when it put up money for Samuel Morse" to develop the telegraph.

January 27, 1962—With the countdown at T-29 minutes, NASA postponed the first US manned orbital flight until February 1 because of cloud cover at the launching site that would have precluded adequate tracking of the vital first few minutes of the flight. John H. Glenn had been in the Mercury capsule atop the Atlas launch vehicle for more than five hours when the launch was postponed.

January 30, 1962—NASA announced at Cape Canaveral that manned MA-6 launch would be postponed until February 13 because of "technical difficulties with the launching booster." John Glenn was quoted as saying: "Sure, I'm disappointed, but this is a complicated business. I don't think we should fly until all elements of the mission are ready. When we have completed all our tests satisfactorily then we'll go."

Three potential recovery areas were recommended for the Mercury extended range or one-day mission. These were: Grand

Turk, Midway Island, and the Japanese-Philippine Island area.

February 1, 1962—NASA Headquarters announced that the Mercury-Atlas 6 manned orbital mission would be scheduled no earlier than February 13, 1962 and that repair of the Atlas launch vehicle fuel tank leak would be completed well before that time.

February 2, 1962—Reported from Cairo, Egypt that Cosmonaut Yuri Gagarin has said that the United States "eventually" would orbit a man around the earth.

Contract Talks Begun With GE For Nimbus-D

NASA will begin negotiations with the General Electric Company's Missile and Space Division, Valley Forge, Pa., for integration and testing of the Nimbus-D meteorological satellite.

Estimated cost of a final contract will be about \$10 million. NASA's Goddard Space Flight Center, Greenbelt, Md., is responsible for Nimbus project management.

Included in the contract will be a structural dynamics model, an electrical systems model and one flight spacecraft. In addition, General Electric will provide a spacecraft-to-launch vehicle adapter for the Nimbus-D launch vehicle, the improved Thor-Agena.

Nimbus-D is expected to be launched early in 1970.

Quiz Doctor On Measles Vaccine

Since the advent of polio vaccine, more children have been killed by measles in recent years than have been killed by polio.

Measles vaccine, introduced in 1963, gives lifetime protection against red or 10-day measles—complications from which include pneumonia, broncho-pneumonia, middle ear infections and encephalitis. Severe complications can cause brain damage and even death.

If you have children between the age of one and five who have not had measles, check with your family physician about measles immunizations.

Credit Union Share Deposits Lag Behind Loan Requests

Share deposits in the MSC Federal Credit Union have been lagging behind loan requests during the past year and the Credit Union has the dragnet out for additional shares to help meet member loan requests.

The Credit Union has been able to meet loan requests by borrowing money at favorable interest rates, but because of the current tight-money situation, "them days are gone forever."

Investment of additional shares is needed now to help loosen the loan-money situation at the Credit Union. If each of the 3300 members deposited one \$5 share per month for the next year, the problem would be greatly relieved. Moreover, the \$60 saved in Credit Union shares during 1967 would be earning money for the shareholder. Last year, the interest paid by the Credit Union was 4.5%.

There is something to be gained from saving through the Credit Union as well as from borrowing money at low interest rates.

Credit Union shareholders are reminded of the annual MSC Federal Credit Union Shareholders Meeting January 26 at 7:30 pm in the Cafeteria.

Centaur Chosen For OAO, ATS 1968 Launches

The Atlas-Centaur has been chosen by NASA to launch the Orbiting Astronomical Observatory series of satellites and Applications Technology Satellites D and E. These launches are scheduled to begin in 1968.

The spacecraft had been scheduled for launch on Atlas-Agena launch vehicles, but the more powerful Atlas-Centaur was substituted because of mission requirements for greater performance.

Switch of these payloads to the Centaur will mean a phase-out of NASA's use of the Atlas-Agena vehicle in 1968 at Cape Kennedy, Fla., after 26 Atlas-Agena missions. To date, in lunar, planetary and Earth satellite missions, NASA has launched 19 Agenas; 14 have been successful.

Use of the single Centaur system for this class of launches will increase the efficiency and economy of NASA's launch operations at Cape Kennedy.

The first NASA Atlas-Agena mission was Ranger I in August 1961. Since then, Agenas have successfully launched Rangers and Lunar Orbiters in photography flights to the Moon; Mariner flights to Venus and Mars; Orbiting Geophysical Observatories, and the first Applications Technology Satellite (ATS-1). Modified Agenas also were launched by the Atlas as target vehicles for the Gemini program.

The Centaur, which was the first rocket to use liquid hydrogen as a fuel, is capable of launching about 40 per cent greater payload than the Agena into a near-Earth orbit and about three times the payload on a lunar trajectory. Centaur successfully launched the first two Surveyor lunar landing spacecraft. The Centaur stage is also being considered as an upper stage for still more powerful launch vehicles in the 1970's.

NASA's Office of Space Science and Applications has program responsibility for the development of both the Agena and Centaur stages; project management is by NASA's Lewis Research Center, Cleveland.

Red Cross Seeks Volunteer Aides For Taub Hospital

MSC area residents who are interested in becoming Red Cross volunteer nurses aides at Ben Taub General Hospital in Houston may enroll in training classes starting January 16 and 17.

The nurses aide training will prepare volunteers to assist the professional staff in direct hospital patient care. Twenty hours of classroom study and 20 hours of actual training at Ben Taub must be satisfactorily completed before students can become certified Red Cross nurses aides. The program prepares volunteer nurses aides, not persons seeking paid employment as aides.

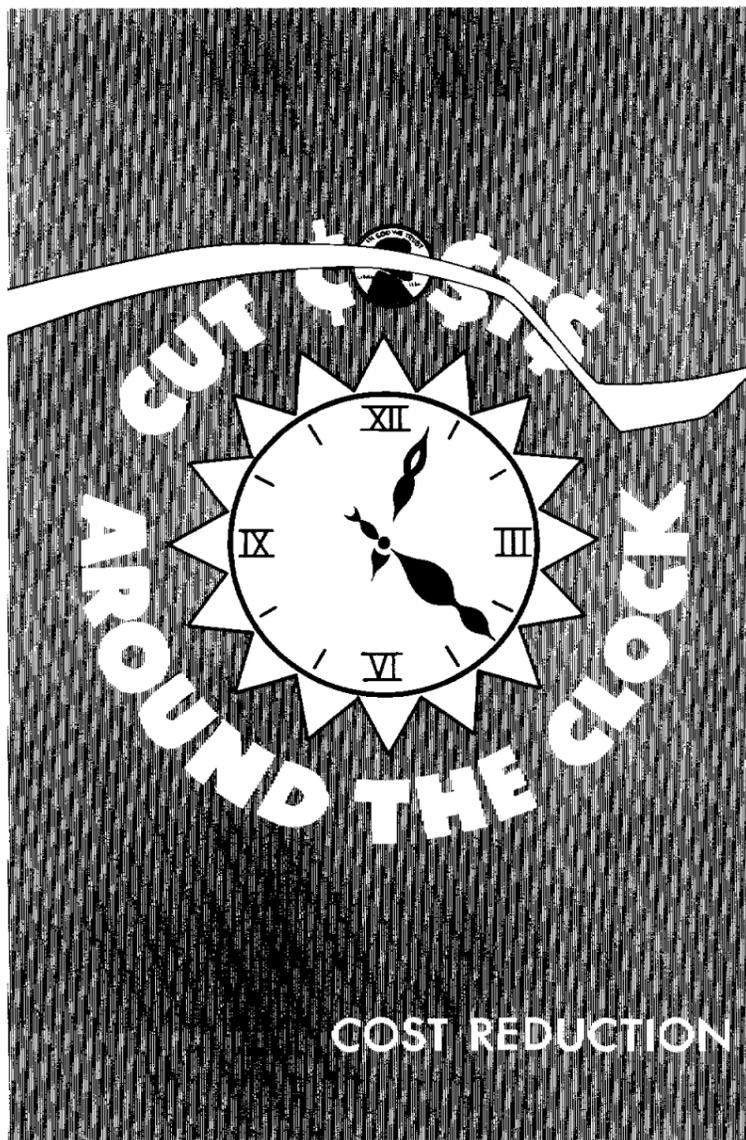
Evening classes beginning January 16 will be from 7 to 10 p.m. at the Houston-Harris County Red Cross Chapter House, 2006 Smith Street, Houston. Morning classes will be from 9 a.m. to 12 noon at the Chapter House, starting January 17.

Interested persons may call the Red Cross at CA 7-1151 to enroll.

Applicants must be at least 18 years of age and have a high school education. Both men and women applicants are sought.

BUY U.S. SAVINGS BONDS

NOW PAYING 4.15% WHEN HELD TO MATURITY



The Roundup is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

Director Dr. Robert R. Gilruth
Public Affairs Officer Paul Haney
Editor Terry White
Staff Photographer A. "Pat" Patnesky

Quality Increases at MSC/St. Louis



A. J. Eaton C. B. Fletcher J. H. Harris Louise Kase K. N. Warren
Employees of Gemini Program Office/St. Louis who recently received Quality Salary Increases.

Flyers Reopen AOPA Course, Ground School

The Aero Club will offer the AOPA 360° Course on January 31 at 5:15 pm in Building 6. The enrollment fee is \$2.00 and includes all handout material and instruction. The ground school will reopen in the near future and will offer two courses—Private Pilot and Instrument.

The next scheduled meeting of the club will be on February 14 at 5:15 pm in Building 6.

The club is presently flying two airplanes, a Cessna 172 and a Cessna 150 which is shown at right. Several memberships are still available. Interested persons should contact L. Bernardi, at 4041.

1966 MSC/EAFB Flag Football League

Final Standings

American Division			National Division		
TEAM	WON	LOST	TEAM	WON	LOST
IESD	10	0	Philco/WDL	10	0
CAD	9	2	USCG	9	1
FSD	8	3	SMD	7	3
MPAD-G&P	6½	3½	IBM	6	4
Lockheed	6½	3½	TRW	6	4
Grumman	4	6	FCD	5	5
2578th	4	6	747th	3	7
P&PD	3	7	MPAD-FSB	3	7
ANG	3	7	NAA	3	7
Link	1½	8½	SSD	2	8
Philco/TR	½	9½	P&PD	1	9

In the second-place American Division playoff, CAD and FSD tied 7-7; in overtime play, CAD gained 40 yards over FSD's 32 yards. In the League championship playoff, IESD defeated USCG 14-12 and CAD defeated Philco/WDL 18-15; in the final game for League champion, CAD defeated IESD 19-6.

Roundup Swap-Shop

(Deadline for classified ads is the Friday preceding Roundup publication date. Ads received after the deadline will be run in the next following issue. Send ads in writing to Roundup Editor, AP3. Ads will not be repeated unless requested. Use name and home telephone number.)

FOR SALE/RENT—REAL ESTATE

Seven acres in League City near Spaceland Airpark; good investment, all or part. \$2350/acre. J. R. Baker, HU 8-0095.

3-bdr 2-bath brick in Pasadena, central air/heat, built-ins, double garage, near shopping centers, schools. Equity plus assume 5½% loan. T. F. Kirkland, HU 6-3240.

3-bdr 2-bath 2-car garage in Pasadena area. Note \$99/mo; equity plus assume 5¼% loan. Monty Moncrief, HU 4-7774.

Rent 2-bdr 1½-bath house on Bayridge Road, LaPorte, central heat, 2-car garage, acre lot, stove-refrigerator furnished, large storage room, across street from Bay. Wilma Wells, SU 1-1515.

FOR SALE—AUTOS

1964 Pontiac station wagon, assume \$1900 Credit Union balance. Luther Palmer, 877-1269.

1966 Pontiac Catalina 9-pass station wagon, pwr brakes/steering/tailgate, factory air, chrome luggage rack, low mileage, less than four months old, perfect condition. \$3295. Kent Grimsley, HU 8-1610.

1961 VW sedan, xcint condition, one owner, 48,000 miles, \$600. Jim Peacock, League City 932-4458.

1966 Mustang, silver-blue, white vinyl top, air, automatic, 6-cyl, tinted glass, bucket seats, wire wheels, whitewalls, radio, other extras. \$2200. G. Shrum, 877-3109.

1962 Rambler Classic 4-door; engine, overdrive, air, body, paint, tires all in good condition, gets 20 mpg, low oil use, priced \$100 below NADA retail. Jim Rippey, 877-1859.

1966 VW, tan-black int, radio, whitewalls, good condition, low mileage. Must sell—leaving Houston. \$1575. Lee Adams, GL 3-7940.

XKE Jaguar Roadster, two years old, white, black top, whitewalls, AM-FM-MB radio, vandal-proof, xcint condition. \$3400. John Boynton, MI 3-0926.

1966 Mustang V-8, stick, factory air, other extras. \$2250 or pay equity and assume Credit Union payments. Coy C. Summers, MI 4-4593 or MI 9-8838.

1929 Ford Tudor sedan. \$550. W. P. Henry, 2107 San Sebastian Court Apt 703, NB 591-3934.

1963 Chevy Impala V-8 4-door sedan, factory air, radio, heater, all power. \$1100. Carl Peterson, GR 4-2776.

1963 VW with air, well kept. \$1075. Dale Nussman, HU 6-0359.

FOR SALE—MISCELLANEOUS

White Danish chairs, \$10 each. Guild electric guitar and speaker, \$140. 10-ft wood stepladder, \$10. Baby crib w/springs, \$20. Baby dressing table, \$10. Single bed w/mattress, \$15. John Fitzgerald, 932-4155.

Two-year old black and silver male German Shepherd, free to someone who can give him more running room than afforded by a city lot. Has had shots. Terry White, 932-4472.

Custom-built electric guitar and large Gibson amp; sell as set only. Guitar is solid-wood flat-body construction, dual pickup, Gibson controls, volume and 3-way switch controls, red velvet-lined case. Amplifier has 70-watt output, three jack outlets, foot-pedal vibrator, volume, tone, depth, frequency controls. Combination: \$125. Jerry T. Kilpatrick, HU 4-8293.

1965 Honda 150, windshield and crash bars, new clutch, good condition. \$360. Jessie Folse, 502 Honeysuckle Dr., LaMarque, WE 5-6546.

Quality German Shepherd puppies, AKC, bred for beauty and intelligence, sired by Cyn's Storm von Richterbach. Henry Howard, HU 2-7082.

Bell & Howell Specialist 398A 16mm sound projector in original packing carton. Charlie Lander, MI 5-2600.

Matching man's and lady's 17-jewel Clinton wristwatches, brand new—won in contest. \$50 F. L. Greene, 591-2305.

Zeis Ikonflex I twin-lens reflex camera, shoots 12 2¼x2¼ pix on 120 film, f/3.5 Zeiss Novar lens in Compur shutter, ever-ready case. \$25. Terry White, 932-4472.

1967 Honda 305 Super Hawk, treated with TLC, xcint condition. \$665. John Hirasaki, MI 9-1800.

Four 7.75x14 whitewall tires in good condition, \$35. Unused monocular microscope, \$25. Automobile airhorn, Italian, \$15. Malcolm Smith, GR 1-1984.

25-ft ChrisCraft Constellation cruiser with galley, head, radiotelephone, depth-recorder, sleeps four, excellent condition, being transferred. \$2895. Garth Summers, HU 4-2721.

12x15 ft gold nylon rug, high-level weave, permepad base, rubber foam textured pad included. Less than half price at \$95. Robert A. Nanz, 7711 Belfort Blvd. Apt 23, MI 5-5329.

1966 Honda Super 90, 170 mpg, 9hp, 65 mph, used six months. \$300. Bob Sayers, NB 591-2395.

1964 10x55 ft Americana mobile home, fully carpeted, window airconditioner, 10x40 ft aluminum awning. D. Barclay, HU 4-5794.

WANTED

Car pool or will pay from 2607 Cedar Drive, La Marque to Bldg 419, 7:30 a.m. to 4 p.m., Evelyn Villeneuve WE 5-3878.

Lost at January 7 performance of Moon-glow 66: pair black kid gloves. Reward. Helen Statz, HU 2-7607.

Child's outdoor gym set. Fireplace screen and andirons. Malcolm Smith, GR 1-1984.

ROUNDUP EMPLOYEE NEWS

Weekend Aviators



PREFLIGHT CONFAB—MSC Aero Club members Lou Bernardi and Don Bray discuss flying characteristics of the Club's Cessna 150 during a weekend flying session at Spaceland Airpark.



VINTAGE BIRD—Don Bray adjusts the shoulder straps in the rear cockpit of a Ryan PT-22 primary trainer of World War II vintage. The open-cockpit low-wing monoplane is powered by a Kinner radial engine with such a distinctive sound that one knows it is a Ryan without even looking.



AIRBORNE—Through concurrent membership in a squadron of the Civil Air Patrol, Aero Club members may fly this Beech T-34—a warmed-over Bonanza utilizing most of the Bonanza's structure but having tandem cockpits and a conventional tail group instead of a four-place cabin and a butterfly tail.

1967 MSC/EAFB Basketball League

American Division		National Division	
1. P&PD	14. G&CD		
2. ISD	15. Mgt. Interns		
3. MPAD-RAB	16. MPAD-Hawks		
4. CAD-Court Jesters	17. FCSD		
5. ASPO-Lunatics	18. IESD/LEC		
6. FSD	19. MPAD Red Roaches		
7. FCD	20. LRD		
8. IBM-Blue	21. IBM-Gold		
9. 747th	22. USCG		
10. TRW	23. Grumman		
11. ANG	24. Philco		
12. Crew Systems/Ham Std	25. Univac		
13. NAA	26. Link		

All games are played at the EAFB Gym. Game times are 5:45 pm, 7:15 pm and 8:45 pm each date in order as listed below. (Teams are listed in schedule by numbers assigned above.)

Jan. 23	Jan. 24	Jan. 25	Jan. 26
3 vs 1	6 vs 11	16 vs 14	19 vs 24
4 vs 13	7 vs 10	17 vs 26	20 vs 23
5 vs 12	8 vs 9	18 vs 25	21 vs 22
Jan. 30	Jan. 31	Feb. 1	Feb. 2
9 vs 7	12 vs 4	22 vs 20	25 vs 17
10 vs 6	13 vs 3	23 vs 19	26 vs 16
11 vs 5	1 vs 2	24 vs 18	14 vs 15

Co-Op of Month



THIRD TOUR—Ivan Ray Moore, Jr., chemical engineering major at Lamar State College of Technology, is in his third co-op tour in the MSC Safety Office where he has shown dependability and initiative in developing safety standards, reviewing test procedures, investigating and analyzing accidents and other safety engineering assignments.

Sports Car Club To Meet Feb. 14

MSC sports car enthusiasts are invited to attend the first monthly meeting of the newly-formed Clear Lake Sports Car Club February 14 at 8 pm in the Nassau Bay National Bank.

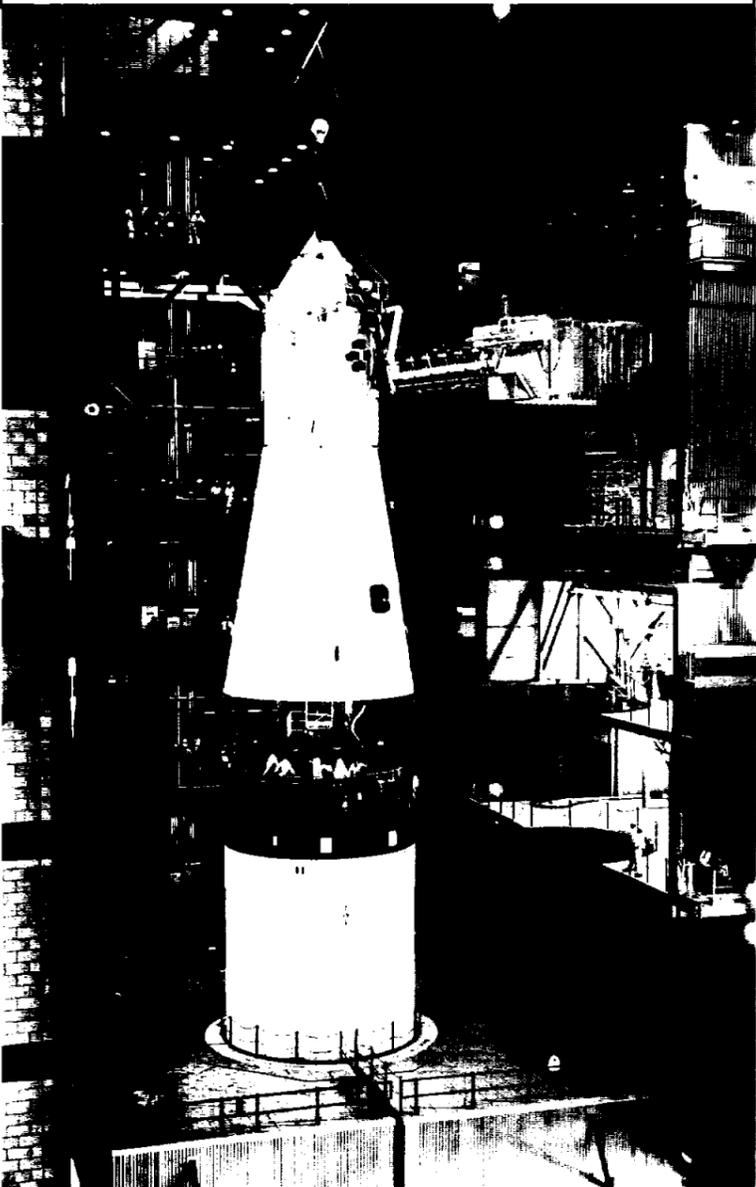
The club has been formed to promote and sponsor auto sports in the Clear Lake area, and events planned include rallies, gymkhanas, tours and social events.

For membership information, call Sonny Flanagan at HU 8-4322 or Paul Siebert at HU 8-0495.

ROUNDUP

SECOND FRONT PAGE

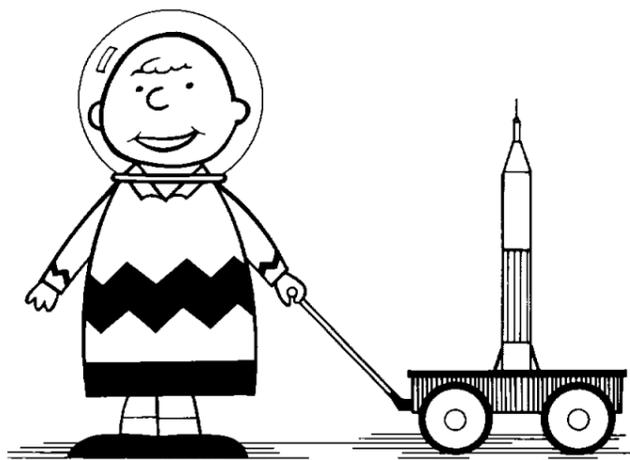
First Saturn V Meets Payload



MATING RITUAL—Apollo spacecraft 017 and its Spacecraft-LM Adapter (SLA) hangs from a crane above the Saturn V S-IVB stage and Instrument Unit in the KSC Vehicle Assembly Building. The stack will be flown in the unmanned Apollo/Saturn 501 mission in the second quarter of 1967—first flight test for Saturn V's three stages, S-IC, S-II and S-IVB.

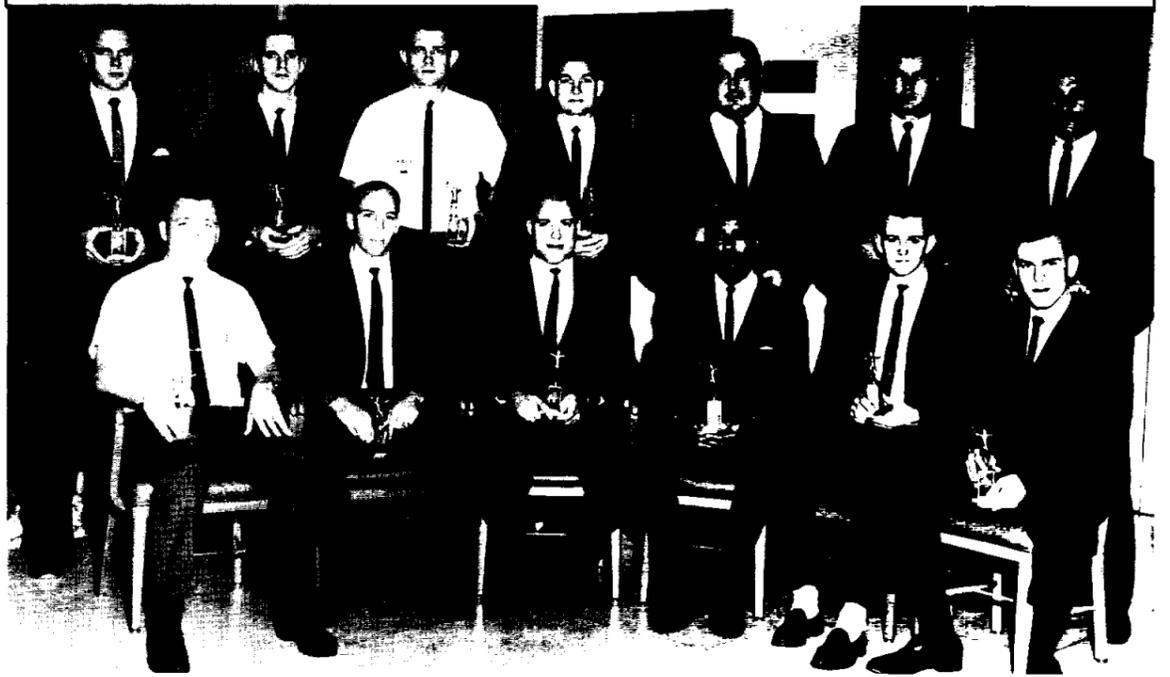
HAPPINESS

IS A FLAWLESS APOLLO MISSION



Keep  the Symbol of Excellence
MANNED FLIGHT AWARENESS

Gridiron Champions



LEAGUE TOPPERS—The Computation and Analysis Division team took home the trophies for winning the 1966 MSC/EAFB Flag Football League Championship. Front row, left to right, are: W. McCollum, R. Kidd, Manager Bill Whatley, P. Brooks, R. Kruse and B. Morrey. Back row: H. Havard, E. Svrcek, L. Ratcliff, O. McCafferty, J. Long, G. Ricks and B. Wiley. Not present for photo: J. Vyner, R. Southers, R. Becker, J. Anderson, J. D. Carr, D. Gurthrie, M. Toomes, D. Dudley and B. Mueller.



RUNNERS-UP—Second place in the League and first in the American Division was the Instrumentation and Electronics Systems Division team. Manager-coach Jim Derbonne holds the team's trophy. Standing from, left to right, are: D. Doherty, G. McGill, B. Foster, P. Golwell, G. McCollum and B. Lippert. Back row: B. Koning, M. Bennett, L. Holguin, R. Hutchins, B. McLaren, C. Hall, H. Rampy and F. Polasek. Not present for photo: D. Welch, G. Lahon, J. Axley, J. Boykin, B. Campbell, L. Dieter, J. Flannagan, J. Pells, B. Ritz, B. Swint, M. Perry, G. Metz, E. Hicks and P. Swanzy.

East End YMCA Needs Support

A varied program of activities for children and grown-ups is offered by the East End YMCA, and MSC employees are invited to participate either as active members of the Y or through support as a sponsor member.

Sponsor member donations insure that no youngster will be turned away from YMCA activities just because he does not have the money for membership.

For details on how to become a regular or sponsor member of the YMCA, call one of the following: Jim Bodmer 3786, Marc Broussard 4928, Bill Drewes 4386, Leroy Ruetz 2201 or Bill Sevier 5576.

MSC BOWLING ROUNDUP

MIMOSA MEN'S LEAGUE
As of January 19

TEAM	WON	LOST
Chizzlers	41½	30½
Whirlwinds	41	31
Technics	40	32
Fabricators	40	32
Alley Oops	38½	33½
Foul Five	38	34
Strikers	37½	34½
Road Runners	37	35
Real Timers	37	35
Weightless Wonders	30	42
Agitators	28	44
Hustlers	23½	48½

High Game: Bill Holton 271, Dan Kennedy and Rod Loe 265.

High Team Game: Chizzlers 1093 and 1086.

High Series: Bill Holton 728, Hal Ferrese 713.

High Team Series: Chizzlers 3122, Whirlwinds 3077.

High Averages: Ken Hecht 180, Dan Kennedy 179, John Dornbach 176.

Credit Union Issues Account Statement

As a part of an audit of the MSC Federal Credit Union, the Credit Union supervisory committee has distributed copies of the statement of account to members as of December 31 whose last names begin with I through L and M through Q.

Credit Union members in these name groups who did not receive their copy of the statement of account should contact Supervisory Committee Chairman James F. Moody, 2609 Sweetgum, Pasadena 77052, or at MSC extension 2828.